

AMENDMENTS TO THE CLAIMS

5 Claim 1 (Currently amended) An extrusion-free wet cleaning process for post-etch Cu-dual damascene structures, the process comprising:

providing a wafer comprising a silicon substrate and at least one post-etch Cu-dual damascene structure, the post-etch Cu-dual damascene structure having a via structure exposing a portion of a Cu wiring line electrically connected with an N⁺ diffusion region of the silicon substrate and a trench structure formed on the via structure;

10 executing an oxidation step by applying a diluted H₂O₂ solution to the wafer to slightly oxidize the surface of the exposed Cu wiring line; and

washing away cupric oxide generated in the oxidation step by means of a cupric oxide cleaning solution containing diluted HF, NH₄F or NH₂OH having a pH of
15 above 7; and

~~preventing Cu reduction reactions on the N⁺ diffusion region connected Cu wiring line.~~

Claims 2-5 (Original)

20

Claim 6 (Currently amended) The process of claim 1 wherein the method of preventing Cu reduction reactions on the Cu wiring line comprises reducing the H₂O₂ concentration of the diluted H₂O₂ solution to below 100:1 (v/v) of solvent to H₂O₂.

25 Claim 7 (Original)

Claim 8 (Cancelled)

Claim 9 (Currently amended) A wet cleaning process comprising:

30 an oxidation step comprising a means for reducing Cu deposition on a cathode-like copper wiring line of a Cu-dual damascene structure, wherein the means for reducing Cu deposition on a cathode-like copper wiring line comprises a step of purging an inert gas during the oxidation process; and

an oxide etch step for washing away cupric oxide generated in the oxidation step by means of a cupric oxide cleaning solution; and

35 ~~reducing Cu deposition on a cathode-like copper wiring line of a Cu-dual damascene structure.~~

Claims 10-13 (Original)

40

Claim 14 (Cancelled)

Claims 15 and 16 (Original)

Claim 17 (Currently amended) The process of claim 9 wherein the process of reducing Cu deposition on a cathode-like copper wiring line comprises reducing the H_2O_2 concentration of the diluted H_2O_2 solution to below 100:1 (v/v) of solvent to H_2O_2 .

5 Claims 18 and 19 (Original)